Technology Fact Sheet
Enhanced Deactivation and Decommissioning (D&D) of Glove Boxes

Rocky Flats Environmental Technology Site (RFETS)
In Partnership with the Office of Science & Technology

Introduction

In FY 1998 the DOE Office of Science and Technology (EM-50) and the Deactivation and Decommissioning Focus Area (DDFA) partnered with the Rocky Flats supporting an Accelerated Site Technology Deployment (ASTD) to positively impact the site's ability to meet its FY 2006 site closure plans. This project supported demonstration of three innovative technologies:

- a Decommissioning In Situ Plutonium Inventory Monitor (DISPIM™)
- a mobile, Waste Isolation Pilot Plant-certified, Standard Waste Box (SWB) counter
- Inner Tent Chamber (ITC)

Technical Needs

More than 900 gloveboxes have been identified at the Rocky Flats site as contaminated with plutonium. This equipment must be removed, size-reduced and disposed of as radioactively contaminated waste.

The need for higher accuracy, lower sensitivity assay equipment has been identified as critical to achieving the accelerated site closure goal of FY 2006. These measurements are needed during D&D planning to better organize tasks and improve estimates of TRU and LLW waste generation rates. DISPIM™ was chosen to meet this need based on demonstrated improvements and performance over current on-site systems.

The need to reduce costs associated with waste handling led Rocky Flats to adopt the Standard Waste Box (SWB) as the primary waste container for TRU contaminated waste. This ASTD also supports the deployment of a WIPP-certified mobile SWB assay system. Use of the SWB and counter system reduces the extent of size reduction activities, results in fewer containers and therefore lowers administrative costs associated with waste shipments.

The desire to improve worker safety and reduce exposure risk during size reduction of gloveboxes led to the deployment of an Inner Tent Chamber (ITC). The chamber removes the worker from the atmosphere where size reduction is taking place.

System Descriptions

DISPIM™ is a passive, neutron, coincidence counter capable of assaying the levels of plutonium present in glove boxes, tanks, etc. to a sensitivity of 1 gram. It also has three 3-D imaging capabilities that can target the locations of "hot spots" to within a few inches.

3-D Imaging DISPIM™

The mobile SWB counter is a self-contained, trailer-mounted system that can easily be transported around the site or between DOE sites. The unit uses High Energy Neutron Counting (HENC) technology. This is a passive neutron coincidence detection assay technology similar to that successfully used for WIPP-certified drum counters. The system will be comprised of proven crate counter components associated with HENC technology, reengineered to accommodate SWB and mobility requirements.

Mobile Standard Waste Box (SWB) Counter

The Inner Tent Chamber (ITC) is an improved ventilation and cutting chamber for the size reduction of gloveboxes. This particulate control and tool support system controls airborne contamination while allowing multiple tool options to be used for size reduction. Operators reach into the chamber to perform many of the operations. For Phase 1, the ITC will accommodate smaller gloveboxes (<4.5'x6'x12'). Phase 2, the ITC will be modified to accommodate 12' gloveboxes. The structure is sufficient for lightweight tools thus supporting improved ergonomics.

Inner Tent Chamber for Glovebox Size Reduction

Benefits

DISPIM™ assists D&D by assaying gloveboxes prior to size reduction. In this way worker safety is enhanced through greater knowledge, and size reduction can be implemented in a manner to minimize the generation of TRU waste.

The WIPP-certified, mobile SWB counter will enable Rocky Flats to meet the more stringent standards that WIPP is expected to impose. Handling and paperwork associated with certification will be reduced by a ratio of 7 to 1. Additionally, a counter with the ability to assay mixed material types will allow relaxation of rigid waste segregation controls that are now required thus lowering administrative costs.

The Inner Tent Chamber supports improved ergonomics for workers, reduces worker exposure risk, and provides an overall enhancement to worker safety.

Status

DISPIM™ was first deployed on site in September 1998. The deployment was considered successful, and it is now being implemented on site. Documentation of the deployment is complete and a video has been prepared.

The mobile SWB counter has been fabricated and is currently undergoing calibration and validation testing at LANL. The system should be delivered to Rocky Flats in April/May 2000, at which time the necessary site protocol will be completed to mobilize the system for waste operations.

The ITC began operation in July 1999 in Building 771 incorporating enhanced mechanical cutting and improved ventilation.

For more information about the deployment of the DISPIM™ or the Standard Wastebox Counter at the Rocky Flats Environmental Technology Site

Contact:
Matthew McCormick, DOE - RFFO at (303) 966-4776, email matthew.mccormick@rfets.gov
Gary Huffman, DOE - RFFO at (303) 966-7470, email gary.huffman@rfets.gov
Jane Powell, DOE-FETC at (304) 285-4687, email jane.powell@netl.doe.gov

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